



A.D. 1822 N° 4633.

S P E C I F I C A T I O N

OF

RICHARD ORMROD.

STEAM BOILERS.

L O N D O N :

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Steam Boilers.

ORMROD'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, RICHARD ORMROD, of Manchester, in the County of Lancaster, Iron Founder, send greeting.

WHEREAS His present Majesty King George the Fourth, in and by His
5 Letters Patent, under the Great Seal of Great Britain, bearing date at Westminster, the Seventh day of January last, for Himself, His heirs and successors, did give and grant unto me, the said Richard Ormrod, His special licence, full power, sole privilege and authority, that I, the said Richard Ormrod, my executors, administrators, and assigns, and every of them, by myself and them-
10 selves, or by my and their deputy and deputies, servants, or agents, or such others as I, the said Richard Ormrod, my executors, administrators, or assigns, should at any time agree with, and no others, from time to time, and at all times thereafter, during the term of years therein mentioned, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of
15 Berwick upon Tweed, "AN IMPROVEMENT IN THE MODE OF HEATING LIQUIDS IN BOILERS, AND THEREBY ACCELERATING AND INCREASING THE PRODUCTION OF STEAM," communicated to me by a certain person residing abroad; in which said Letters Patent there is contained a proviso, obliging me, the said Richard Ormrod, by an instrument in writing under my hand and seal, particularly to describe and
20 ascertain the nature of the said Invention, and in what manner the same is to be performed, and to cause the same to be inrolled in His Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said recited Letters Patent, as in and by the same, reference being thereunto had, will more fully appear.

25 NOW KNOW YE, that in compliance with the said proviso, I, the said Richard Ormrod, do hereby declare that the nature of the said Invention of an

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Improvement in the Mode of Heating Liquids in Boilers, and thereby Accelerating and Increasing the Production of Steam, which has been communicated to me as aforesaid, is particularly described and ascertain in and by the annexed Sheet of Drawings or Plans, and in the following description thereof, that is to say:—

Figure 1 upon the Sheet of Drawings represents a longitudinal section of a boiler, of the form usually denominated waggon or oval boiler. The section is supposed to be taken through the centre of the boiler, in order to explain the nature of the improvement. Figure 2 represents an horizontal plan, wherein the boiler itself is supposed to be removed, to explain the improved construction of the fire-place and flues; and Figure 3, a transverse section through the boiler and fire-place. . Note: the Figures are drawn to a scale of about half an inch to a foot, and the same characters or letters of reference are used to denote the same parts upon the various Figures whenever they occur. A, A, represent the boiler, which is surrounded by brickwork B, B, in the usual manner, so as to form flues *d, d, e, e*, for the flame and smoke to pass through in their passage to the chimney D, which is situated at one of the angles of the boiler, as shewn in the plan, Figure 2. E represents the ash-pit, and F the grating bars upon which the fire is lighted, being supplied with a current of fresh air from the ash-pit through the openings between the grating bars. The two sides of the fire-place or furnace are formed by square trunks or pipes of metal G, G, which are connected together by a cross trunk H forming the bridge of the furnace for the fire to pass over, as seen by the arrows in the plan, Figure 2. The two trunks G, G, are also united by a cross trunk I, the upper part of which is intended to correspond to the form of the boiler bottom, or otherwise to be made straight and filled in above with brickwork, so as to touch the boiler, as shewn in the Figure 3, which latter method I prefer. The section of the trunk H is inclined, as seen in Figure 1, and the two trunks G, G, are so formed on their under surfaces as to correspond with the inclination of the grating bars F. The ends of the said trunks are continued through the brickwork B surrounding the boiler, and are there closed by covers K, K, bolted on to their flanges, which covers may be removed for the purpose of cleaning out the trunks, as occasion may require. L, L, represents a metal pipe, which is flanged on to the middle of the cross trunk H, and is continued along in the broad flue *b, b*, beneath the boiler bottom and passes through the brickwork B, where it is closed by a cover M, secured to its flange in the same manner as before mentioned for the trunks G, G. The cover M is capable of being removed for the purpose of clearing the pipe L, L, from any crust or sediment which may be deposited from the water contained therein. N represents an elbow pipe, which communicates

FIG. 2.

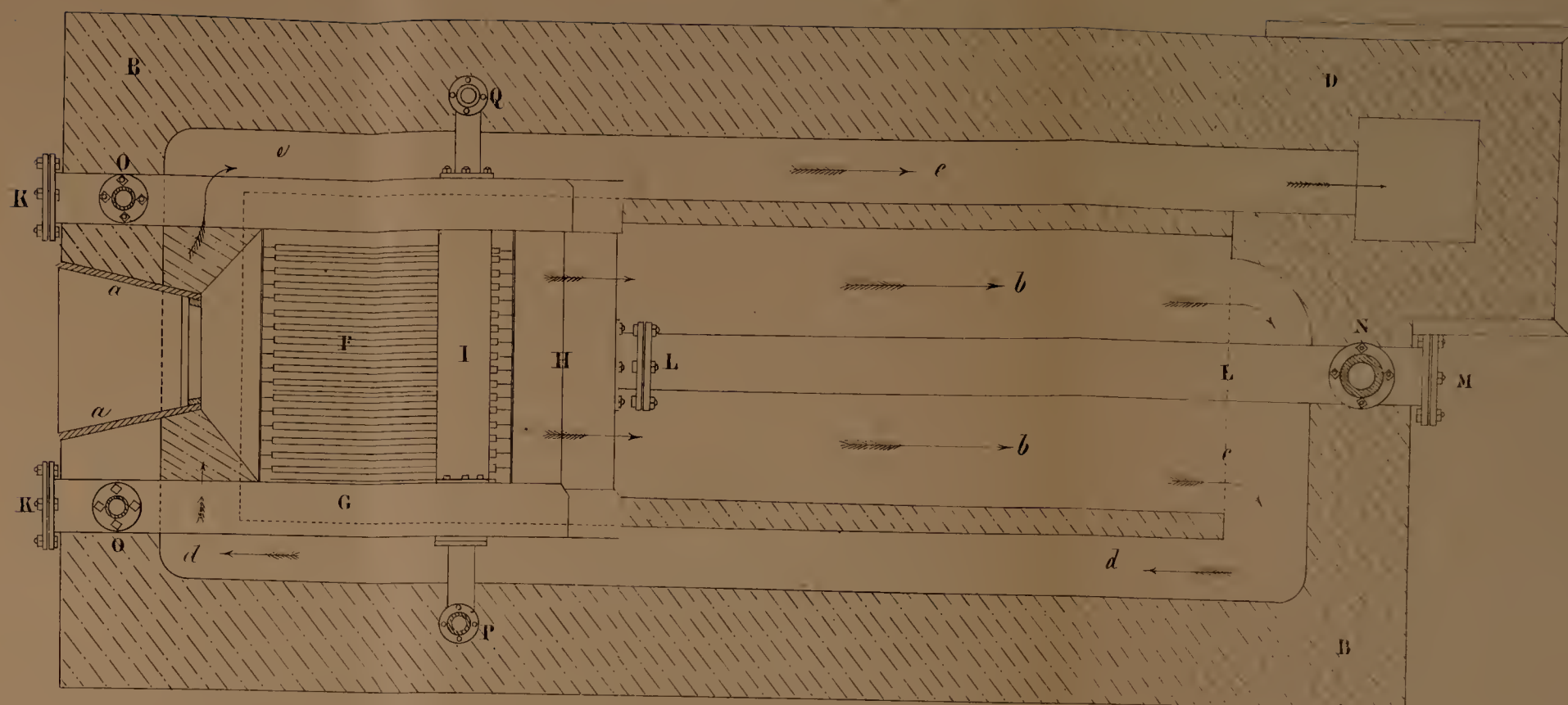
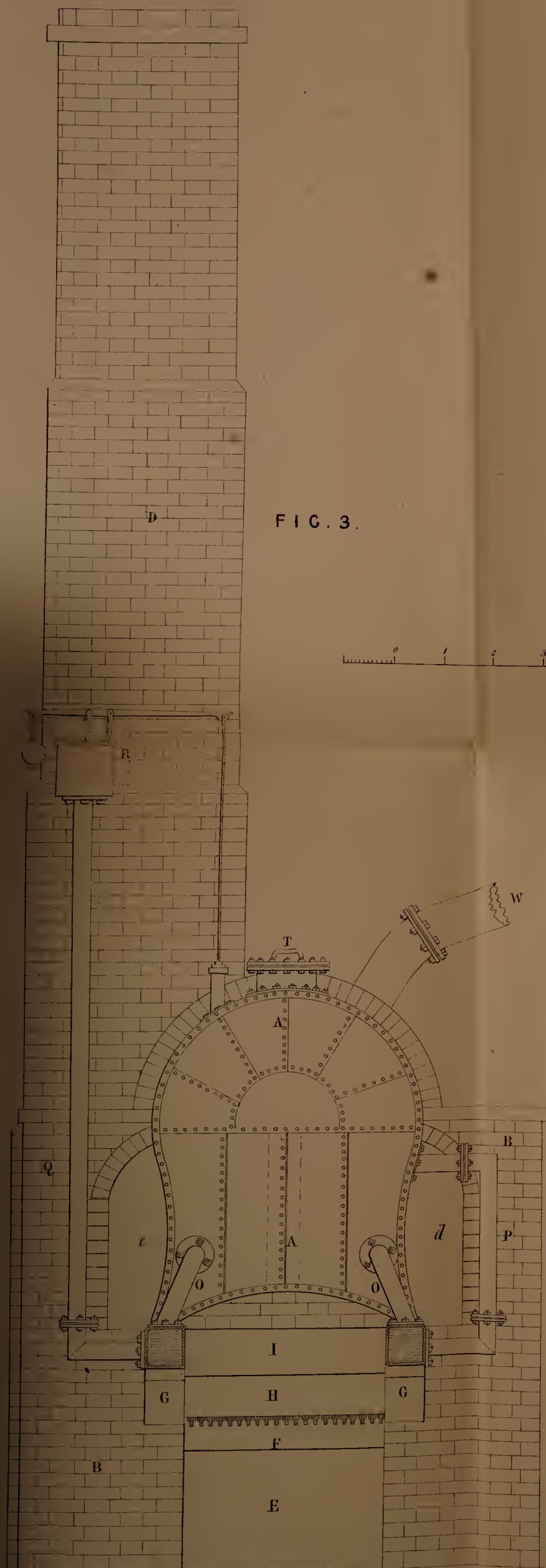
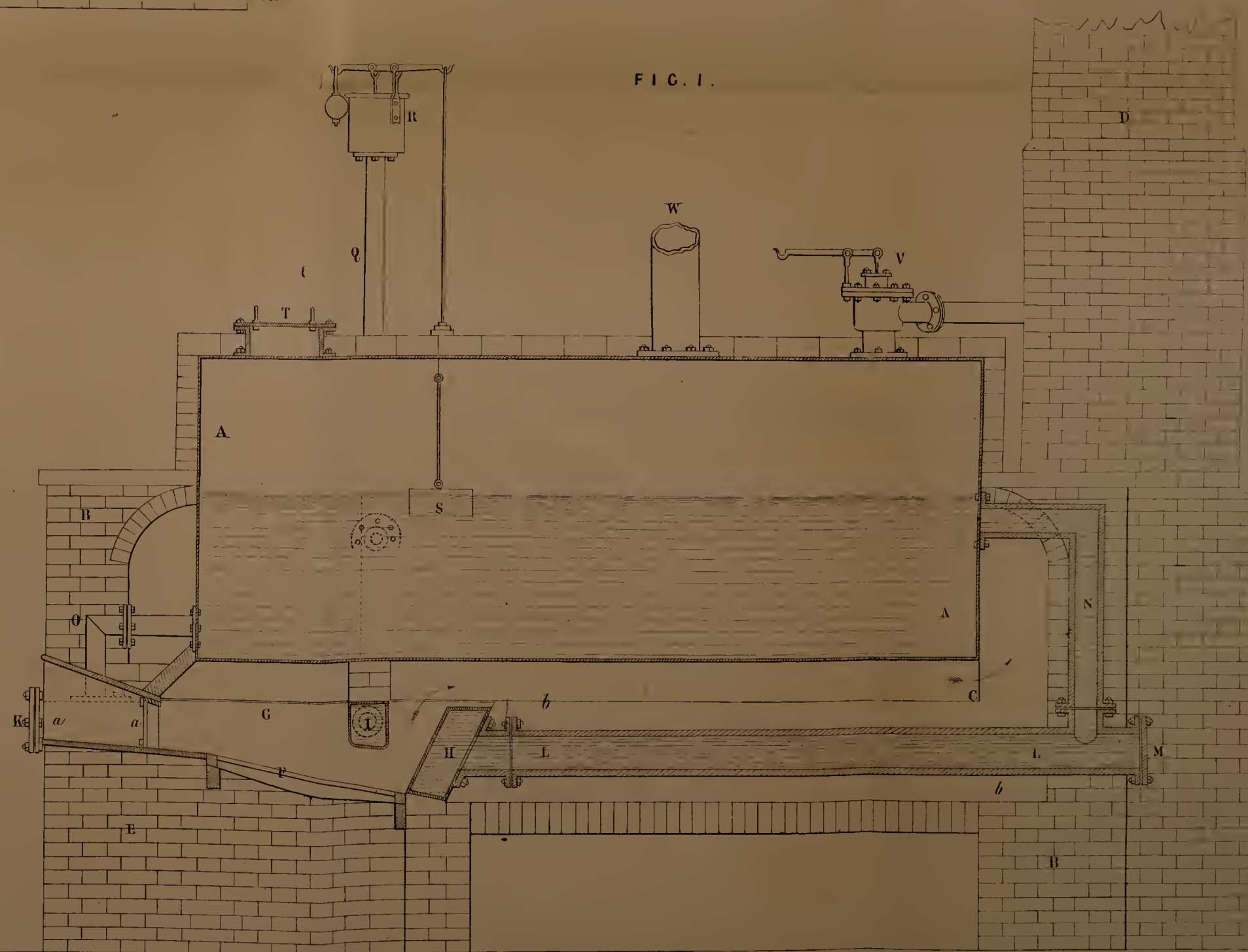


FIG. 3.

Scale of Feet
0 1 2 3 4 5 6 7 8 9 10 11 feet.

FIG. 1.



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at one end with the pipe L, L, and at the other end with the boiler A, A, at about the level of the water line. O, O, represent two other elbow pipes, which are flanged upon and communicate with the trunks G, G, at bottom, whilst their upper ends are connected with the boiler near to the bottom thereof. P, Figure 3, 5 shews a pipe, which is flanged to one of the trunks G at the part where the trunk I joins with it; the upper end of the pipe P enters the boiler near to the level of the water line. The boiler is supplied with water through the feeding or stand pipe Q, which joins to the trunk G opposite to the pipe P, as will clearly be seen in the plan, Figure 2. The upper end of the stand pipe Q is furnished 10 with a small cistern R, having a valve in the bottom thereof, which valve is opened or shut by the action of the float S within the boiler so as to admit water into the boiler as fast as it is evaporated, and keep it to an uniform level, in the same manner as the float and stand pipe, for the supply of the boilers at present in use. T represents the man-hole, which serves to enter the boiler by, when it 15 requires cleaning out and repairing. V shews the safety valve, which prevents the danger of the boiler's bursting by the steam becoming too strong; and W, the steam pipe for the conveying the steam off from the boiler. The operation effected by the present improvement is as follows:—The boiler is fitted, with water to a proper level, through the stand pipe Q, in which case the trunks G, G, 20 forming the sides of the fire-place or furnace, are entirely filled with water, as well as the cross trunks H and I, and the straight pipe L, L, and the elbow pipes N, O, O, and P, before described. The fire being now lighted in the furnace through the fire door or opening *a, a*, the flame and smoke is obliged to pass under the cross trunk I, and then rises and passes over the bridge or 25 trunk H, and continues its course along the broad flue *b, b*, under the boiler bottom and surrounding the pipe L, L. The flame and smoke then passes through the take-up at *c*, and proceeds along in the flue *d, d*, and round the end of the boiler over the fire door *a, a*, and then along the flue *e, e*, on the other side of the boiler, until the smoke escapes finally into the chimney D. By this 30 arrangement the water contained in the side trunks G, G, receives a great portion of heat, which in the ordinary construction of boiler furnaces is suffered to pass off into the brickwork instead of producing any good effect. At the same time the cross trunks I and H are completely exposed to the action of the fire, as also the pipe L, L, which causes a great quantity of steam to be generated 35 and pass up through the elbow pipes N, O, O, and P, into the boiler A, A, from which it may be conducted through the pipe W to supply a steam engine, or or any other purposes to which the employment of steam may be applicable. In this apparatus the feed or supply of water is regularly introduced into the trunks situated beneath the boiler, as before mentioned, instead of being intro-

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duced into the boiler itself, as is generally practised in the boilers at present in use. By this circumstance the water comes at first into a part which is exposed to the most direct action of the fire, and only rises into the boiler at the boiling temperature, so as not to condense the steam which is generated therein. The pipes and trunks above mentioned may be made either of wrought or cast iron or of copper, but I prefer the wrought iron for those parts where the fire operates, as being more durable. It must be remarked, that where copper is used for the trunks and pipes, the boiler must be wholly made of copper, to prevent the metals destroying each other by oxidation. The trunks and pipes may be either of a cylindrical, oval, or square form, or any other form which may be considered most convenient. Having already described the nature of the said Invention in such a manner as to enable persons (conversant with works of a similar description) to put it in practice, it remains for me to state what I consider as constituting my claim; for I do hereby declare that I do not make claim generally to the employment of tubes, pipes, or trunks of metal situated under a boiler and connected therewith, such apparatus having been before used, but I confine my claim to the new mode of combination and arrangement of the said trunks and pipes passing on each side of the fire-place or furnace and communicating with the boiler in the manner herein-before described and set forth, such new mode of arrangement and combination being very effective in accelerating and increasing the production of steam in the boilers generally. The form and proportion of the parts may be varied according to the discretion of the workmen, still producing the same effect.

In witness whereof, I, the said Richard Ormrod, have hereunto set my hand and seal, the Third day of July, in the year of our Lord One thousand eight hundred and twenty-two.

RICHARD (L.S.) ORMROD.

AND BE IT REMEMBERED, that on the same Third day of July, in the year above mentioned, the aforesaid Richard Ormrod came before our Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and everything therein contained. And also the Specification aforesaid was stamped according to the tenor of the Statute in that case made and provided.

Inrolled the Sixth day of July, in the year above written.

F. P. STRATFORD.

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